WHAT IS CLAIMED IS:

- 1 1. An isolated and purified banana DNA molecule, said DNA molecule
- 2 being differentially expressed during banana fruit development.
- 1 2. A DNA molecule according to claim 1, wherein said DNA molecule
- 2 encodes a protein selected from the group consisting of a starch synthase, a
- 3 granule-bound starch synthase, a chitinase, an endochintinase, a beta-1,3
- 4 glucanase, a thaumatin-like protein, an ascorbate peroxidase, a metallothionein, a
- 5 lectin, and another senescence-related protein.
- 1 3. A DNA molecule according to claim 1, selected from the group
- 2 consisting of clones pBAN 3-33, pBAN 3-18, pBAN 3-30, pBAN 3-24, pBAN 1-
- 3 3, pBAN 3-28, pBAN 3-25, pBAN 3-6, pBAN 3-23, pBAN 3-32, and pBAN 3-46.
- 1 4. A DNA molecule according to claim 1, wherein said DNA molecule
- 2 has the nucleotide sequence selected from the group consisisting of SEQ ID NO: 1,
- 3 SEQ ID NO: 2, and SEQ ID NO: 3.
- 5. A DNA molecule according to claim 1, wherein said DNA molecule
- 2 encodes a protein having an amino acid sequence selected from the group
- 3 consisting of SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, the DNA sequence
- 4 shown in Figure 16, the DNA sequence shown in Figure 17, the DNA sequence
- shown in Figure 18, and the DNA sequence shown in Figure 19.
- 1 6. A chimeric gene comprising a DNA molecule which is differentially
- 2 expressed during banana fruit development operably linked to a heterologous
- 3 promoter.

- 7. A replicable expression vector comprising the chimeric gene of claim 6.
- 1 8. A plant genome, comprising the chimeric gene of claim 6.
- 1 9. A plant cell, comprising the chimeric gene of claim 6.
- 1 10. A plant comprising the chimeric gene of claim 6, wherein said 2 chimeric gene is stably integrated into the plant genome.
- 1 11. An isolated and purified banana protein which is differentially 2 produced in developing banana fruit.
- 1 12. A protein according to claim 11, wherein said protein is a selected 2 from the group consisting of a starch synthase, a granule-bound starch synthase, a 3 chitinase, an endochitinase, a beta-1,3 glucanase, a thaumatin-like protein, an 4 ascorbate peroxidase, a metallothionein, a lectin, and another senescence-related 5 protein.
- 1 13. A protein according to claim 11, wherein said protein is encoded by a DNA molecule selected from the group consisting of clones pBAN 3-33, pBAN 3-18, pBAN 3-30, pBAN 3-24, pBAN 1-3, pBAN 3-28, pBAN 3-25, pBAN 3-6, pBAN 3-23, pBAN 3-32, and pBAN 3-46.
- 1 14. A protein according to claim 11, wherein said protein has an amino 2 acid sequence selected from the group consisting of SEQ ID NO: 4, SEQ ID NO: 3 5, SEQ ID NO: 6, the amino acid sequence shown in Figure 16, the amino acid 4 sequence shown in Figure 17, the amino acid sequence shown in Figure 18, and 5 the amino acid sequence shown in Figure 19.

1

2

21.

23.

1 15. A composition comprising the protein of claim 11 and a carrier 2 therefor. 1 16. A plant cell comprising the protein of claim 11. 1 17. An isolated and purified banana DNA regulatory element which is 5' 2 or 3' to a gene which is differentially expressed during fruit development. A regulatory element according to claim 17, wherein said regulatory 1 18. 2 element is activated by an ethylene signal. A regulatory element according to claim 18, wherein the ethylene 1 19 2 signal is produced by developing fruit. 1 20. A regulatory element according to claim 18, wherein the ethylene 2 signal is produced by exogenous ethylene gas. 1 21. A chimeric gene comprising a banana DNA regulatory element operably linked to a heterologous DNA molecule, wherein said regulatory element 2 is naturally found, or is derived from a sequence naturally found, 5' or 3' to a gene 3 which is differentially expressed during fruit development. 4 A plant genome comprising a chimeric gene according to claim 21. 22. 1

A plant cell transformed with a chimeric gene according to claim

1

33.

1	24.	A plant comprising a chimeric gene according to claim 21, wherein
2	said chimeric	gene is stably integrated into the plant genome.
1	25.	A method for expression of heterologous protein in fruit comprising
2	transforming fruiting plants with a chimeric gene according to claim 21, exposing	
3	said fruit to an plant development signal, and harvesting fruit containing said	
4	heterologous	protein.
1	26.	The method of claim 25, wherein the plant development signal is
2	ethylene gas produced by ripening fruit.	
1	27.	The method of claim 25, wherein the plant development signal is
2	exogenous et	hylene gas.
1	28.	The method of claim 25, further comprising the step of isolating the
2	heterologous proteins from the harvested fruit.	
1	29.	The method of claim 25, wherein the heterologous protein is a
2	therapeutic protein.	
1	30.	A fruit produced by the method of claim 25.
1	31.	The fruit of claim 30, wherein said fruit is a banana.
1	32.	A protein produced by the method of claim 25.

A protein produced by the method of claim 28.

- 1 34. A plant comprising a chimeric gene according to claim 24, wherein 2 said plant is a monocot.
- 1 35. A plant comprising a chimeric gene according to claim 34, wherein 2 said monocot is a banana plant.
- 1 36. A plant comprising a chimeric gene according to claim 24, wherein 2 said plant is a dicot.
- 1 37. A plant comprising a chimeric gene according to claim 36, wherein 2 said dicot is a tomato plant.
- 1 38. The fruit of claim 30, wherein said fruit is a tomato.
- 1 39. A regulatory element according to claim 17, wherein said regulatory element is a 5' upstream promoter region of the p31 gene.
- 1 40. A regulatory element according to claim 39, wherein said regulatory element has the nucleotide sequence of SEQ ID NO:44 or is a fragment thereof.
- 1 41. A regulatory element according to claim 39, wherein said 5'
- 2 upstream region of the p31 gene has the nucleotide sequence of SEQ ID NO: 45 or
- 3 is a fragment thereof.
- 1 42. A chimeric gene according to claim 21, wherein said regulatory 2 element is a 5' upstream promoter region of the p31 gene.
- 1 43. A chimeric gene according to claim 21, wherein said regulatory 2 element has the nucleotide sequence of SEQ ID NO: 44 or is a fragment thereof.

- 1 44. A chimeric gene according to claim 21, wherein said regulatory
- 2 element has the nucleotide sequence of SEQ ID NO: 45 or is a fragment thereof.